

Lab 4 - EIGRP

Lab 4: IP routing protocol lab — EIGRP

The physical topology is as shown in Figure 15–4.

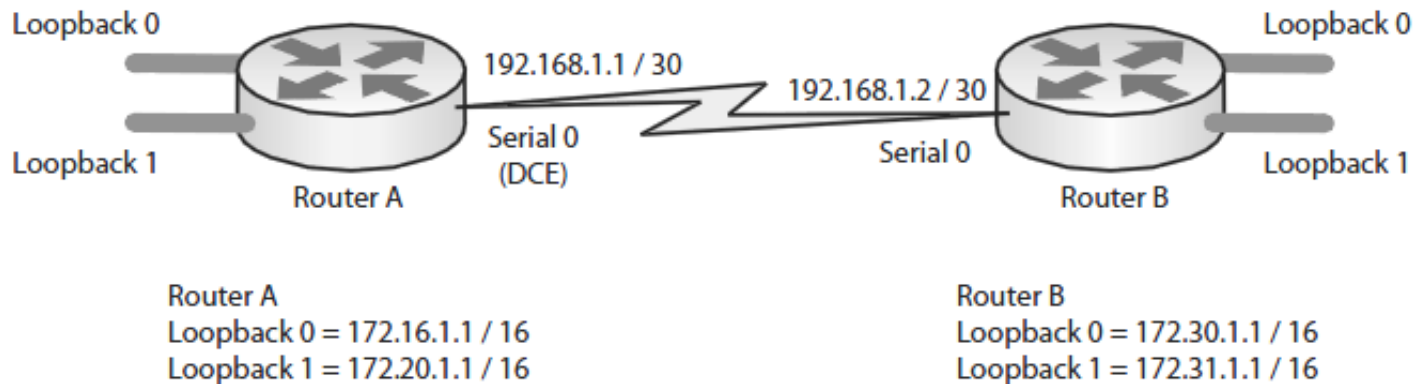


Figure 15–4: EIGRP lab

Lab exercise

Your task is to configure the network in Figure 15–4 to allow full connectivity using the EIGRP routing protocol. Please feel free to try the lab without following the lab walk-through section.

Text written in monospaced type indicates commands that can be entered on the router.

Purpose

EIGRP is a very popular routing protocols and in wide use today. You will need to have a good working knowledge of it for the CCNA exam and as a Cisco engineer.

Lab objectives

1. Use the IP-addressing scheme depicted in Figure 15–4. The student who is using router A needs to configure a clock rate on interface serial 0: set this to 64000.
2. Set telnet access for the router to use the local login permissions of username “banbury” and the password “ccna”.
3. Configure the “enable password” to be “cisco”.
4. Configure the EIGRP routing protocol to advertise all networks attached to the router.
5. Ensure the routing information is correct by checking the routing table for entries of your neighbor's addresses.
6. Finally, try to ping all loopback interfaces of your neighbor, and then try to access your neighbor router via telnet.

Lab walk-through

1. To set the IP addresses on an interface, you will need to do the following:

```
Router#config t
Router(config)#hostname RouterA
RouterA(config)#
RouterA(config)#interface serial 0
RouterA(config-if)#ip address 192.168.1.1 255.255.255.252
RouterA(config-if)#clock rate 64000 « If this is the DCE side
RouterA(config-if)#no shutdown
RouterA(config-if)#interface loopback 0 « No “no shut” required
RouterA(config-if)#ip address 172.16.1.1 255.255.0.0
RouterA(config-if)#interface loopback 1
RouterA(config-if)#ip address 172.20.1.1 255.255.0.0
RouterA(config-if)# ^ Z
RouterA#
```

Router B:

```
Router#config t
Router(config)#hostname RouterB
RouterB(config)#
RouterB(config)#interface serial 0
RouterB(config-if)#ip address 192.168.1.2 255.255.255.252
RouterB(config-if)#no shutdown
RouterB(config-if)#interface loopback 0
RouterB(config-if)#ip address 172.30.1.1 255.255.0.0
RouterB(config-if)#interface loopback 1
RouterB(config-if)#ip address 172.31.1.1 255.255.0.0
RouterB(config-if)# ^ Z
RouterB#
```

2. To set the clock rate on a serial interface (DCE connection only), you need to use the “clock rate #” command on the serial interface, where # indicates the speed:

```
RouterA(config-if)#clock rate 64000
```

Ping across the serial link now.

3. To set telnet access, you need to configure the VTY lines to allow telnet access. To do

this, type (from configuration mode):

```
RouterA(config)#line vty 0 4 « Enters the VTY line configuration
```

```
RouterA(config-line)#login local « This will use local usernames  
and passwords for telnet access
```

```
RouterA(config-line)#exit « Exit the VTY config mode
```

```
RouterA(config)#username banbury password ccna « Creates username and  
password for telnet access (login local)
```

Router B:

```
RouterB(config)#line vty 0 4
```

```
RouterB(config-line)#login local
```

```
RouterB(config-line)#exit
```

```
RouterB(config)#username banbury password ccna
```

4. To set the "enable password", do the following:

```
RouterA(config)#enable secret cisco « Sets the "enable password" (encrypted)
```

Router B:

```
RouterB(config)#enable secret cisco
```

5. To configure EIGRP on a router there are two steps: first, enable the routing protocol and second, specify the networks to be advertised by EIGRP.

```
RouterA(config)#router eigrp 20
```

```
RouterA(config-router)#network 192.168.1.0 « Specifies the networks  
for EIGRP to advertise; one network statement  
is needed for every network advertised
```

```
RouterA(config-router)#network 172.16.0.0
```

```
RouterA(config-router)#network 172.20.0.0
```

```
RouterA(config-router)#no auto-summary « This command prevents the  
router from summarizing the 192.168.1.0 network
```

Router B:

```
RouterB(config)#router eigrp 20
```

```
RouterB(config-router)#network 192.168.1.0
```

```
RouterB(config-router)#network 172.30.0.0
```

```
RouterB(config-router)#network 172.31.0.0
```

```
RouterB(config-router)#no auto-summary
```

Use the “show ip route” command to determine if the networks being advertised by your neighbor's EIGRP process are in your routing table.

Without the “no auto-summary” command, the router would automatically summarize at the major subnet boundary. It is not so important for this lab. However, if you were using 10.0.0.0 addressing, the network details would be summarized to 10.0.0.0. Make sure you are aware of the “no auto-summary” command and when you would want to use it.

```
RouterA#show ip route
```

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B

BGP, D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area, N1

- OSPF NSSA external type 1, N2 - OSPF NSSA external type 2, E1 - OSPF

external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter

area, * - candidate default, U - per-user static route, o ODR, P -

periodic downloaded static route

Gateway of last resort is not set

```
C 172.16.0.0/16 is directly connected, Loopback0
```

```
C 172.20.0.0/16 is directly connected, Loopback1
```

```
D 172.31.0.0/16 [90/2297856] via 192.168.1.2, 00:00:03, Serial0
```

```
D 172.30.0.0/16 [90/2297856] via 192.168.1.2, 00:00:03, Serial0
```

```
192.168.1.0/30 is subnetted, 1 subnets
```

```
C 192.168.1.0 is directly connected, Serial0
```

```
RouterA#
```

You may also have a summary route in your routing table.

```
RouterA#show ip protocols
```

Routing Protocol is "eigrp 20"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Default networks flagged in outgoing updates

Default networks accepted from incoming updates

EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0

EIGRP maximum hopcount 100

EIGRP maximum metric variance 1

Redistributing: eigrp 20

Automatic network summarization is not in effect

Maximum path: 4

Routing for Networks:

172.16.0.0

172.20.0.0

192.168.1.0

Routing Information Sources:

Gateway	Distance	Last Update
(this router)	90	00:03:23
192.168.1.2	90	00:02:08

Distance: internal 90 external 170

6. To test connectivity, you will need to use the ping command and to logon to your neighbor's router, you need to use the telnet command:

RouterA#ping 172.30.1.1 « This will send a ping packet to the address specified; there should be five replies if everything is OK

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.30.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 32/32/32 ms

RouterA#ping 172.31.1.1

RouterA#telnet 172.30.1. « **This will open a telnet connection to your neighbor's router. If telnet access has been set up correctly,**

you should be presented with a login message.

Trying 172.30.1.1 ... Open

User Access Verification

Username: banbury

Password:

RouterB>exit

[Connection to 172.30.1.1 closed by foreign host]

RouterA#

Router B:

Do the same on router B:

RouterB#ping 172.20.1.1

RouterB#ping 172.16.1.1

RouterB#telnet 172.20.1.1

Other commands to try:

debug ip eigrp

show ip eigrp neighbors

show ip eigrp topology

show ip eigrp interfaces

7. Now please enter reload at the "Router#" prompt and type "yes".

Show runs

RouterA#show run

Building configuration...

Current configuration : 838 bytes

!

version 12.1

service timestamps debug uptime

service timestamps log uptime

no service password-encryption

!

```
hostname RouterA

!

enable secret 5 $1$rujl$BJ8GgiK8U9p5cdfXyApPr/

!

username banbury password 0 ccna

!

ip subnet-zero

!

interface Loopback0

 ip address 172.16.1.1 255.255.0.0

!

interface Loopback1

 ip address 172.20.1.1 255.255.0.0

!

interface Ethernet0

 no ip address

 shutdown

!

interface Serial0

 ip address 192.168.1.1 255.255.255.252

 clockrate 64000

!

interface Serial1

 no ip address

 shutdown

!

interface BRI0

 no ip address

 shutdown

!

router eigrp 20

 network 172.16.0.0

 network 172.20.0.0

 network 192.168.1.0
```

```
no auto-summary
no eigrp log-neighbor-changes
!
ip classless
no ip http server
!
line con 0
!
line aux 0
line vty 0 4
login local
!
end
```

RouterA#

RouterB#show run

Building configuration.

Current configuration : 824 bytes

```
!
version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname RouterB
!
enable secret 5 $1$ydeA$MyfRKeVOckjm7w/0ornnB1
!
username banbury password 0 ccna
!
ip subnet-zero
```



```
!  
interface Loopback0  
 ip address 172.30.1.1 255.255.0.0  
!  
interface Loopback1  
 ip address 172.31.1.1 255.255.0.0  
!  
interface Serial0  
 ip address 192.168.1.2 255.255.255.252  
!  
interface Serial1  
 no ip address  
 shutdown  
!  
interface Ethernet0  
 no ip address  
 shutdown  
!  
interface BRI0  
 no ip address  
 shutdown  
  
!  
router eigrp 20  
 network 172.30.0.0  
 network 172.31.0.0  
 network 192.168.1.0  
 no auto-summary  
 no eigrp log-neighbor-changes  
!  
ip classless  
 no ip http server  
!  
line con 0  
!
```

```
line aux 0  
line vty 0 4  
login local  
!  
end
```

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